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Weight-Bearing Interventions to Decrease Spasticity and Improve Gait in Stroke Patients: A Case Report

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INTRODUCTION

- Stroke, also known as cerebrovascular accident (CVA), is an interruption of blood supply to the brain, either by blockage of arteries (ischemic stroke) or bursting of vessels (hemorrhagic stroke), preventing brain tissues from receiving oxygen.
- According to Central Disease for Control and Prevention (CDC), stroke is the 5th leading cause of death in the United States.
- While stroke affects multiple systems in the body, it can cause spasticity in muscles of the body affecting a person's ability to walk in a coordinated manner. Spasticity is an abnormal increase in tone of the muscles that can interfere with rehabilitation in those who have experienced a stroke.²

PURPOSE

The purpose of this case report is to determine the success of weight-bearing interventions on spasticity reduction and improved gait patterns for patients who are recovering from a chronic CVA.

CASE DESCRIPTION

Patient Profile:

- The patient is a 61-year-old male who experienced a left hemorrhagic CVA in September 2017 causing right hemiparesis.
- Prior to his CVA, he was independent in all life aspects and was an active runner and golfer.
- He has received prior rehabilitation, including outpatient physical therapy and occupational therapy.

Body Structure and Function Limitations:

- Right upper and lower extremity spasticity
- Circumduction gait
- Weakness and decreased range of motion of right extremities

Activity Limitations:

- Inability to drive
- Decreased ability to negotiate stairs without holding on to the rail
- Decreased ability to ambulate safely.

Participation Restrictions:

- Driving to therapy sessions
- Going for >1 mile walks around the neighborhood
- Playing golf
- Reaching behind back during bathing
- Preparing his own lunch.

EXAMINATION FINDINGS

Outcome Measure	Week 1
TUG (fall risk ≥ 15 seconds)	<ul style="list-style-type: none">TUG time (with quad cane): 48.2 secTUG time (without quad cane): 1 min 23 secTUG time (with AFO and quad cane): 43.2 secTUG time (with ACE wrap and quad cane): 58.5 sec
5x Sit to Stand (fall risk ≤ 11.4)	23.3 sec

Joint	Initial Evaluation PROM (Right/Left)
Dorsiflexion	-5/4
Plantarflexion	42/60
Knee Extension	0/0
Knee Flexion	130/135
Hip Flexion	110/114

Modified Ashworth Scale	
Location	Week 1
R Shoulder Flexors	1+
R Shoulder Extensors	3
R Elbow Flexors	1
R Elbow Extensors	1
R Wrist Flexors	1
R Wrist Extensors	1
R Hip Flexors	1
R Hip Extensors	1
R Knee Flexors	1
R Knee Extensors	1
R Dorsiflexors	1+
R Plantarflexors	3

PLAN OF CARE

Frequency and Duration:

- 1 time/week for 4 weeks

Interventions:

Stretching

- Standing calf stretches

Strengthening

- Seated toe raises

Weight-Bearing

- Pre-Gait Sequence

Gait Training

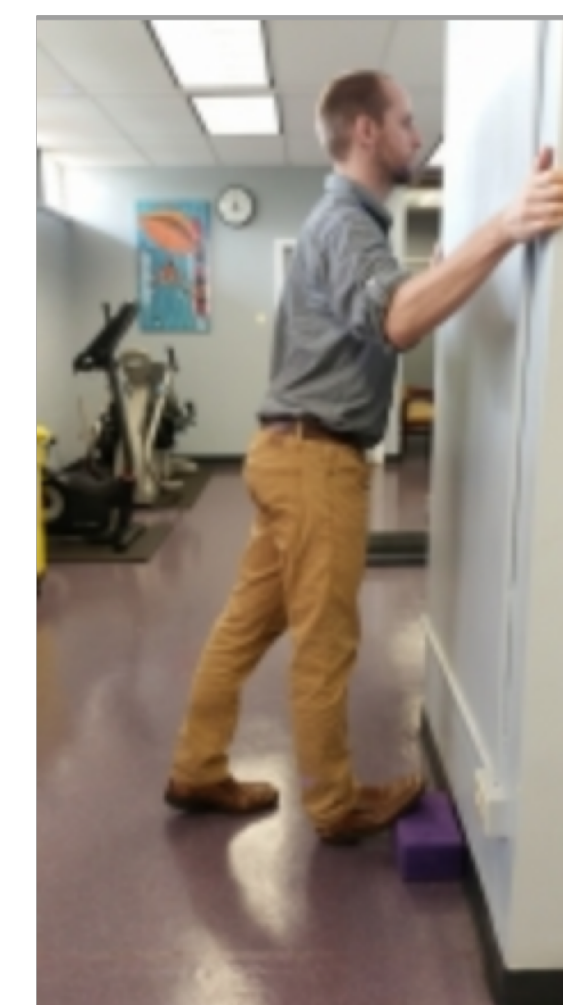
- Obstacle course

Patient Education

- Utilizing R UE to prevent further muscle atrophy and tightness

Progression Criteria:

- Based on patient's functional status
- Exercises were progressed through the pre-gait sequence, obstacle courses with objects to step over and ambulating various distances.



OUTCOMES

Outcome Measure	Week 4
TUG	<ul style="list-style-type: none">TUG time (with quad cane): 44.17 secTUG time (without quad cane): 61.48 secTUG time (with AFO and quad cane): 38.40 secTUG time (with ACE wrap and quad cane): 43.26 sec
5x Sit to Stand	19.82 sec

Joint	Discharge PROM (Right/Left)
Dorsiflexion	-3/4
Plantarflexion	37/60
Knee Extension	0/0
Knee Flexion	138/135
Hip Flexion	120/114

Modified Ashworth Scale	
Location	Week 4
R Shoulder Flexors	0
R Shoulder Extensors	1
R Elbow Flexors	2
R Elbow Extensors	1
R Wrist Flexors	0
R Wrist Extensors	2
R Hip Flexors	0
R Hip Extensors	1
R Knee Flexors	0
R Knee Extensors	0
R Dorsiflexors	0
R Plantarflexors	1+

DISCUSSION AND CONCLUSION

- For a patient with chronic CVA, weight-bearing interventions are effective in reducing spasticity, increasing ROM, and improving gait patterns.
- Application of weight-bearing through the paretic limb has demonstrated improvements in this patient's TUG and 5xSTS score.

CLINICAL RELEVANCE

- In addition to stretching and strengthening, weight-bearing interventions should be incorporated into intervention plans for patients who are recovering from a CVA.
- Interventions should be task-oriented to show the best improvements with activity limitations and participation restrictions in patients recovering from a CVA.

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